CHAPTER II
ESSAY ON ACUTE RESPIRATORY INFECTION

2.1 Introduction

Acute respiratory tract infection (ARI) is a leading cause of Pediatric morbidity and mortality throughout the developing world. Yet in spite of the worldwide impact of ARI, for many years the problem in developing countries was largely overlooked as attention remained focused on diarrheal diseases. Moreover ARI comprises a complex and heterogeneous group of conditions with a variety of clinical manifestations and a great number of etiologic agents.

As late as in 1979 a major report on infectious disease problems in developing countries did not include childhood Pneumoria, referred to as Acute Respiratory Infection (ARI) , as a high Priority Problem, because "a specific causative agent could not be established in most patients."

In 1982, however, WHO established a special Programme for the Control of ARI, linked with the Diarrhea Control Programme. With the success of the latter in decreasing the mortality of children, the relative importance of the respiratory infections has increased. A programme for control effort for ARI was developed by the WHO that could be applied in Primary Health Care (PHC) setting without diagnostic technology.

The broad spectrum of causative microbes and associated variable clinical syndromes in children delayed the development of simply defined clinical criteria. Traditionally the acute respiratory infections have been classified in three groups. Upper respiratory tract infections (URIs) include pharyngitis, tonsillitis, sinusitis, and otitis media. Midrespiratory tract syndromes consist of laryngotracheobronchitis and epiglottitis. Acute lower respiratory tract infections include bronchiolitis and Pneumonia. Acute infections of the lower respiratory tract in (ALRIs) children have a major public health impact.

The majority of ARI deaths occur in socially and economically deprived countries. Since death usually is due to a combination of social, economic and medical factors, it has been impossible to obtain precise data on the associated causes. The problem of ARI, however, does not appear to have a clear-cut solution. Even ARI itself has never been a clear-cut problem. Data on the incidence of acute lower respiratory infection (ALRI) in the developing world, on the case fatality rate for known cases, on microbial etiologies and on mortality of various ages were available from various sources, but data collection methodologies were diverse and not always clearly described.

2.1.1 Significance of the problem:

We have noted that acute respiratory infections are recognized as a major public health problem; each year more than 14 million children die, and 30% of these deaths (more than 4 million), are due to acute respiratory tract infection (ARI). ARI is infact the major cause of preventable death among the children of the developing world. (Grant, 1990).

ARI is a major cause of childhood sickness, the leading contributor to the total disability adjusted life years (DALYS) in under five children. ARI accounts for 30 -50% of visits by children to health facilities and 20 - 40% of hospital admissions of children. (WHO, 1993).

A joint statement says that about 20% of infants born in developing countries fail to survive to their fifth birthday. (UNICEF - WHO, 1985).

ARI presents an immense disease burden both to the community and to the health services. At least one - third of symptomatic illnesses in children under five are due to ARI infections.(Ruutu,1994).

In 1990, 12.9 million children under the age of five cied and 4.3 million (which is 33.1% of all child deaths were due to acute respiratory infections, mainly pneumonia. (WHO, 1992).

The overall incidence of ARI among children in developing countries does not appear to be higher than that amcng children in developed countries, but an important difference appears to lie in the relative frequency and severity of lower respiratory infection(LRI) and pneumonia in particular. (Pio and Leowski, 1983).

Another aspect of the ARI problem, is the elusive nature of ARI, which has been confirmed by many studies. Even the differences among the studies are intriguing. In some places (e.g. Bangladesh), bronchiolitis, as opposed to pneumonia, did not seem to be a cause for hospitalization. In others (e.g. Philippines) female gender was a risk factor for high mortality. At some centers (e.g.Pakistan),

Haemophilus was found to be as common as the *Pneumococcus*, while at others (e.g. Bangladesh), Haemophilus rarely appeared as a cause of bacteremia. The incidence of respiratory syncytial virus (RSV) peaked in some areas during the dry season and in others during the rainy season. (McIntosh, 1990).

Anatomical and etiological classifications have proven to be of no practical value because most of ARI deaths occur in rural areas where physicians are not available. The stress now is more on recognition of the severity of illness, which calls for different courses of action. (Akbar, 1986).

ARI is also a leading cause for children to use the health service in both developed and developing countries. It is also the illnesses most frequently associated with unnecessary use of antibiotics and other drugs. Thus, a large amount of money is spent by families and government without benefit. (WHO, 1991).

2.2 Epidemiology of risk factors of childhood ARI

A number of risk factors related to the host and the environment increase the morbidity and mortality from pneumonia. These risk factors include low birth weight, malnutrition, lack of EPI coverage, low socio-economic status and poor hygiene. Many of these risk factors are interacting with complex mechanisms. For example, the mothers education and her knowledge of appropriate foods for infants may interact to cause malnutrition in children and render them more susceptible to infection.

2.2.1 Nutritional status:

Poor nutrition lowers both systemic and local defenses against ARI, including reduction of the effectiveness of epithelial barrier, systemic immune responses, and cough reflexes. Studies have shown that the risk of death of malnourished children with severe pneumonia is two to three times higher than that of healthy children. (Tupasi, 1990).

2.2.2 Low birth weight:

Low birth weight occurs in 15 - 30 percent of newborns in developing countries and is associated with an increased risk of morbidity and mortality from pneumonia. Low birth weight infants had twice the risk of dying from ARI compared with infants of 3 - 4 kilograms in weight. (ARI - Bohol Project, 1992).

2.2.3 Breast-feeding:

Breast feeding is considered as first immunization of the child. Breast feeding of infants in early life is associated with reduced risk of respiratory infections. Result of studies from developing countries tend to support a protective support of breast feeding. (ARI-Bohol Project, 1992).

2.2.4 Indoor air pollution:

Large proportion of the world household biofuel (wood, crop residues and animal dung) are used for cooking daily, with poor ventilation which increases the

range of levels of indoor particulate pollution. Biofuel is a risk factor for ARI, but its relative significance in relation to other risk factors is difficult to establish.

2.3   WHO classification of ARI on clinical severity of illness:

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For developing countries, limited resource, limited health personnel especially doctors does not allow everyone to get their treatment.. But this classification emphasize critical signs that a minimally trained health worker can learn to recognize, clearly defined signs that are relevant to two management decisions: should an antibiotic be given to a child with ARI, and should the child be treated at home or a hospital.

Thus in the case management three main groups of children with ARI are to be identified: those with severe pneumonia or other very severe disease who require antibiotics and immediate for inpatient care; those who have pneumonia and need antibiotic treatment at home and those who do not have pneumonia treated at home without antibiotic. The two entry criteria of the WHO case management are cough or difficulty of breathing (fast breathing) and chest indrawing. Fast breathing for infants 2 - 11 months old is defined as a respiratory rate (RR) of 50 per minute or above. For children 1 - 5 years old, the cut-off is 40 per minute. It is essential that the RR is recorded when the child is calm and not crying. Chest indrawing, defined as an

indrawing of the lower chest wall when the child breathes in. The is a sign of severe pneumonia.

The simple clinical criteria used in the case management decision algorithm correlate so well with diagnostics employing chest X-ray that radiological investigations are not necessary at the primary levels of health care. Many studies have shown that fast breathing is a better predictor of pneumonia in children than other clinical signs wheeze, chest indrawing etc. (WHO, 1991). Despite the differences in design and methods, studies shows that the case-management strategy has the potential for a substantial effect on infant and under-five mortality, (Sazawal,1992) Little information is so far available on the feasibility and sustainability of the ARI control programme as a part of PHC services. The constraints on the availability of antibiotics, particularly in the poorest countries with high infant mortality, could severely limit the impact of this approach.

2.4 Role of maternal knowledge on ARI:

As the mother is the key care giver in the family, her knowledge about ARI and care-seeking for her child is very essential. Promotion of health, early detection of disease and to know where and when to look for treatment are the basic essentials a mother should be informed with. In developing countries, the growth of population on one side and limited resources on the other makes fulfillment of health service demand difficult. Health services in developing countries can never meet the demand without maternal knowledge and practice.

The mother must be seen as an important member of the "health team". She will be more concerned about her baby than anyone else and will watch the baby more carefully. But she needs education that is consistent with the education given to health workers, so that she knows what signs and symptoms are regarded by health workers as important and what is the basis for seeking diagnosis and treatment. (Riley, 1985).

2.4.1 Mother home care practice: (WHO Recommendation)

These are the activities mothers undertake with the intention of enhancing\bettering health, preventing disease, limiting illness and restoring health.

- Immunization for DPT, Polio, Measles

- Identification of mild, moderate and severe cases of ARI

- Supportive treatment for mild cases

- Antibiotics for moderate cases

- Hospitalization for severe cases

- Continuation of breast feeding

- Quantity of food and drink should be increased during illness and recovery phase

- Clearing of blocked nose

- Providing warmth for cold weather

- Loosening the clothes for possible interference

- Increase moisture in the air to soothe the upper respiratory tract

2.5 Strategies for intervention

The WHO established in 1982 a global programme for the control of ARI using three major strategies: improving childhood immunization rates against diptheria, pertussis, measles and tuberculosis; case management; and health education. Gradual reduction of risk factors for ARI is another long term strategy. At present ARI case management, combined with health education, is the core strategy of the ARI Control Programme.

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2.5.1 Immunization

Against diptheria, pertussis measles and childhood tuberculosis should get high priority since these conditions contribute heavily to childhood mortality and morbidity. Universal acceptance of EPI will play an important role in the overall strategy of ARI control.

2.5.2 Standardized case management

Standardized case management outlined by World Health Organization is a proven strategy for reducing morbidity and mortality from pneumonia among children in developing countries like Bangladesh. In the case management three main groups

of children are to be identified: those with severe pneumonia or other very severe disease who require antibiotics and immediate referral for inpatient care; those who have pneumonia and need antibiotic treatment at home; and those who do not have pneumonia needs home care management. The two entry criteria of the WHO case management are cough or difficulty of breathing (fast breathing) and chest indrawing. Fast breathing for infants 2-11 months old is defined as a respiratory rate (RR) of 50 per minute or above. For children 1-4 years old, the cut-off is 40 per minute. It is essential that the RR is recorded when the child is calm and not crying. Chest indrawing , defined as an indrawing of the lower chest wall when the child breaths in. This is a sign of severe pneumonia.

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2.5.3 Health Education

Health education is a basic component of ARI control programmes. Effective treatment is dependent on mothers and other child careers recognizing the critical signs of pneumonia and acting immediately to seek help.(WHO, 1986). Health education aimed at accomplishing several tasks: increasing the capability of families to recognize a child with pneumonia as separate from those without pneumonia (only cough and colds) and to decide when to seek help; educate the mothers in simple supportive therapy of ARI and to refrain from using ineffective remedies as cough syrups. Promoting the timely immunization against measles, pertussis, diptheria and tuberculosis; promote breast-feeding.

Mothers play a major role in the prevention and control ARI, by early detecting of signs and symptoms, taking decision to seek care and compliance with prescribed treatments and environmental activities aimed at prevention and protection.

2.6 Justification for the study in Bangladesh.

Child mortality is still the world's largest public health problem in terms of numbers of individual dying and years of life lost. ARI is the leading cause of child mortality and morbidity in the developing world.

In Bangladesh ARI in under five children is the leading reason of the use of health services and one of the most important causes of death in children. Hospital records indicate that upto 66 % of urban Paediatric consultation and 30 % of rural consultation are due to ARI. Pneumonia is

the most serious from of ARI and accounts for 80 % of ARI deaths (Govt. of Bangladesh, 1989)

The above discussion reflects the present scenario ; it is clear that family planning will not be successful in poorer sections of the country , if increased child survival cannot be ensured.

In Bangladesh the research on ARI has been mainly to investigate their etiology and risk factors but studies on knowledge and practice of mothers regarding ARI in children are still very limited.

The ARI Control Programme of Bangladesh has given importance to research in the area of KAP of mothers with special attention in delayed seeking of care, and failure to recognize the important signs of ARI. Both of these are postulated to be major reasons of increase mortality in under five children due to ARI.

ARI prevails as a significant problem in Bangladesh, where the treatment facilities are limited. Ignorance, prejudice, inadequate knowledge of the people, particularly of the mothers, is mainly responsible for its excessive consequences. Owing to ignorance or inadequate knowledge, resources, the mothers cannot properly take care of their ill children. In the management of children during their illness, it is very important for the mothers to have knowledge about ARI, as the children mostly depends upon the knowledge of the mothers about ARI.

If ARI is not prevented or early diagnosed and treated in time, the ultimate outcome for many will be sufferings from complications and death. This causes great burden sorrow and economic loss to the society, and equally to the family.

To upgrade the knowledge, training programmes on the ARI control strategy are indispensable. Assessment of the existing level of mothers knowledge and practice acts as a guideline to the extent of training which mothers need. With this view in mind, the study will be conducted on mothers of children below 5 years of age with ARI in urban communities of Dhaka city to assess mothers level of knowledge and practice about ARI in children.

2.7 Objectives of the study:

General objective :

- To assess the existing level of knowledge and care seeking pattern of mothers of under five children with ARI.

Specific objectives :-

- To assess the existing level of knowledge of mothers of under five children regarding sign/symptoms of ARI.
- To determine the ability of mothers to identify (recognize) important signs of severe ARI and their care seeking pattern.
- To determine the home care practices of mothers of children with ARI.

2.8 Research Question:

- What is the existing knowledge and practice of mothers in cases of ARI in their own under five children in urban communities in Bangladesh.

- What are the patterns of signs and symptoms presenting in under five children with ARI (as perceived by their mothers) in urban communities Bangladesh.

2.9 Issues :

The issues arising from global ARI Problem are :-

- Although most ARI episodes are due to common cold and resolve themselves, the most serious episodes mainly Pneumonia - represent a major public health problem.

- Families spend much time, effort and money travelling to health centers treatment - if they were better informed these valuable resources might be better used and they would know when it is necessary to seek help.

- Much clinic and health worker time is taken up in seeing the large number of children presenting with ARI - training health workers to distinguish serious cases requiring treatment, from simple infections, which do not, must be a priority.

- Enormous government and individual expenditure is committed to ineffective and potentially harmful treatments, while antibiotics vital for Pneumonia treatment are unavailable.

2.10 Conclusion :

Acute respiratory infection is a global public health prcblem, but the enormity of the problem is more in developing countries, endangering thousands of lives of children each year. This places a huge burden on health services - through the high proportion of out-patient visits and also the large amount of unnecessary prescribing of drugs for these common infection.

Multiple pathogens, overlapping clinical syndromes, multiple risk factors and tenacity of ARI makes it unlikely that there is truly a comprehensive solution. The basic understanding of etiology and epidemiology of ARI is an important start - but it is only a start. With all the complexities of ARI, it is unrealistic to search for a "magic bullet"

The early detection and appropriate treatment of ARI in members of the community will contribute greatly to prevention of the development of severe respiratory illness and therefore, to mortality.

As well, the developing countries must try to improve and enhance immunization coverage by increasing the activities of the expanded programme on Immunization (EPI)

One must also place emphasis on the importance of continuing research on ARI, especially to learn why such a large proportion of children develop more - severe infections, some of which are fatal.